Customer No.: 31561
Application No.: 10/708,372
Docket No.: 12680-US-PA

## REMARKS

***Present Status of the Application***

Claims 12-26 remain pending. In the outstanding Office Action, Claims 12-14, 16-22 and 24-26 were rejected under 35 U.S.C. 102(b) as being anticipated by Thei et al. (US-6,335,249, hereinafter Thei); and Claims 12-26 were rejected under 35 U.S.C. 102(b) as being anticipated by Lin. et al. (US-6,211,022, hereinafter Lin).

For at least the following reasons, Applicant respectfully submits that claims 12-26 are in proper condition for allowance. Reconsideration is respectfully requested.

***Discussion of the claim rejection under 35 USC 102***

*1. The Office Action rejected Claims 12-14, 16-22 and 24-26 under 35 U.S.C. 102(b) as being anticipated by Thei et al. (US-6,335,249, hereinafter Thei).*

Applicant respectfully disagrees and would like to point out that rejection under 35 U.S.C. 102 requires that each and every elements of the claim(s) must be disclosed exactly by a single prior art reference.

Applicant respectfully submits that Thei cannot anticipate the proposed independent Claim 12 because Thei substantially fails to teach or disclose each and every features of the claimed invention as claimed in the proposed independent Claim 12. More specifically, Thei substantially fails to teach or disclose a shallow trench isolation comprising at least [a liner layer, formed over the substrate covering the insulating layer **so that the liner layer protects the shallow trench isolation from external stress or thermal effects**] as required by the proposed independent claim 12. The advantage of the features recited above is that at least the possibility of damage to STI due to external

stress or thermal effects during the subsequent semiconductor processing can be effectively reduced.

Applicant respectfully submits that as argued in response to the prior first office action, the conformal etch-stop layer (24) of Thei, which the Examiner deems equivalent to the liner layer of the present invention, is in fact formed on the STI (12) AFTER the TWO RTAs processes are performed to form the metal salicide (22) (FIGS. 1-3, col. 5, line 1 to col. 6, line 1). Thus, the conformal etch-stop layer (24) of Thei cannot function to protect the STI (12) during the RTAs processes because the etch-stop layer was not formed on the STI (12) prior to performing the RTA processes. Because the STI (12) was directly exposed to RTAs processes during the formation of metal salicide (22), and therefore, according to the present inventors, defects such as dislocations in the STI (12) may occur.

Applicant would like to point out that a patentable invention may lie in the discovery of the source of a problem even though the remedy may be obvious once the source of the problem is identified, and the question here is whether the prior art, Thei, discovered/recognized the cause of the dislocation of the STI, which the present inventors intends to solve. Because Thei substantially teaches the step of forming the conformal etch-stop layer (24) on the STI (12) after the exposure of the STI (12) to the RTA processes used for forming metal salicide (22), therefore Thei substantially fails to recognize the cause of the dislocation of the STI. In other words, HAD Thei recognized the cause of the dislocation of the STI (12) due to external stress or thermal stress, Thei would have taught forming the conformal etch-stop layer (24) on the STI (12) before

performing the RTA processes to form the metal salicide (22) because RTA processes are thermal process that could cause dislocation of the STI (12). Accordingly, Applicants respectfully submit that Thei cannot possibly anticipate the proposed independent claim 12 of the claimed invention in this regard.

Thus, Thei substantially fails to teach or disclose a shallow trench isolation comprising at least [a liner layer, formed over the substrate covering the insulating layer **so that the liner layer protects the shallow trench isolation from external stress or thermal effects**] as required by the proposed independent claim 12, and therefore Thei cannot possibly anticipate Claim 12 in this regard.

Because the proposed independent claim 20 also recites features that are similar to the proposed independent claim 12, therefore Applicants similarly submit that claim 20 also patently define over Thei for at least the same reasons discussed above.

Claims 13-14 and 16-19, and Claims 20-22 and 24-26, which directly or indirectly depend from independent Claims 12 and 20 respectively are also patentable over Thei at least because of their dependency from an allowable base claim.

For at least the foregoing reasons, Applicant respectfully submits that claims 12-14, 16-22 and 24-26 patently define over Thei. Reconsideration and withdrawal of above rejections is respectfully requested.

*2. The Office Action rejected Claims 12-26 under 35 U.S.C. 102(b) as being anticipated by Lin et al. (US-6,211,022, hereinafter Lin).*

Applicant respectfully disagrees and would like to point out that the present invention as claimed in claims 12 and 20 are directed to a structure of a Shallow Trench Isolation (STI). To the contrary, Lin substantially teaches or discloses a structure of a field oxide (FOX) 204 (please see FIG. 2, col. 2, lines 52-60).

Applicant respectfully submits that it is well known that the structure of FOX is formed by forming a patterned photoresist layer or the like on a silicon substrate, wherein the patterned photoresist or the like exposes a portion of the silicon substrate; and performing a thermal oxidation process so that the exposed portion of the silicon substrate is oxidized to form a silicon oxide layer. Whereas, a shallow trench isolation is formed by forming a shallow trench in a silicon substrate and then filling the shallow trench with a silicon oxide layer. Accordingly, the structure of a FOX does not comprise any shallow trench and silicon oxide layer filling the shallow trench.

In other words, the structure of FOX (204) disclosed by Lin is totally different from the structure of STI of the claimed invention. Therefore, Lin substantially fails to teach each and every elements of the claimed invention as claimed in claims 12 and 20.

Furthermore, Applicant respectfully submits that no dislocations/defects or Si recess issues that exist in STI, do not exist in the field oxide. Therefore, the liner layer (212) of Lin is not used for protecting the FOX from dislocations/defects or Si recess problems.

Accordingly, Applicant respectfully submits that the technical field of Lin is completely different from that of the claimed invention. That is, Lin is a non-analogous

art. Therefore, Applicant respectfully submits that Lin cannot possibly anticipate the proposed independent claims 12 and 20.

Claims 13-19 and claims 21-26, which directly or indirectly depend from independent claims 12 and 20, are also patentable over Lin at least because of their dependency from an allowable base claim.

For at least the foregoing reasons, Applicant respectfully submits that claims 12-26 patently define over Lin. Reconsideration and withdrawal of above rejections is respectfully requested.

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## CONCLUSION

For at least the foregoing reasons, it is believed that all pending claims 12-26 are in proper condition for allowance. If the Examiner believes that a conference would be of value in expediting the prosecution of this application, he is cordially invited to telephone the undersigned counsel to arrange for such a conference.

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Respectfully submitted,

Belinda Lee

Belinda Lee
Registration No.: 46,863

Jianq Chyun Intellectual Property Office
7th Floor-1, No. 100
Roosevelt Road, Section 2
Taipei, 100
Taiwan
Tel: 011-886-2-2369-2800
Fax: 011-886-2-2369-7233
Email: belinda@jcipgroup.com.tw ;usa@jcipgroup.com.tw